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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/681,632 | 10/08/2003 | Jean-Pierre Tranier | Serie 5970 | 6117 |

7590 03/16/2006

Air Liquide
Intellectual Property Department
Suite 1800
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Houston, TX 77056

EXAMINER

DOERRLER, WILLIAM CHARLES

| | |
|----------|--------------|
| ART UNIT | PAPER NUMBER |
|----------|--------------|

3744

DATE MAILED: 03/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|--|---|--|
| Office Action Summary | Application No. 10/681,632 | Applicant(s) TRANIER, JEAN-PIERRE | |
| | Examiner William C. Doerrler | Art Unit 3744 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-62 is/are pending in the application.
 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 10, 15-19, 23, 28-35, 40, 41, 45-50, 52, 56-59 and 62 is/are rejected.
- 7) ☒ Claim(s) 6-9, 11-14, 20-22, 24-27, 36-39, 42-44, 51, 53-55, 60 and 61 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>4-28-2005</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 37,46,50 and 59 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 37 "liquefying vaporizing" is confusing since a substance usually does one or the other. In claim 46, it is unclear if "a cold fluid" is the same as "a cold fluid" from claim 45, from which it depends. Claim 50 is unclear. Specifically, "a refrigeration for the liquefaction of the natural gas that will undergo an isentropic expansion." It is unclear if "refrigeration" should be --refrigeration system-- or --refrigerant--, and whether it is the refrigerant or the natural gas that undergoes the expansion. Claim 59 claims that each distillation plant provides all the refrigeration required to liquefy the natural gas, yet claim 58, from which claim 59 depends, claims that each of the distillation plants provide part of the required refrigeration.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1,2,4,5,10,15,16,18,19,23,28-30,33-35,40,41,45,47,52,56,57,58 and 62 are rejected under 35 U.S.C. 103(a) as being unpatentable over the '388 British patent from the IDS in view of Gaumer et al.

The British '388 patent discloses applicant's basic inventive concept, a system which separates air which enter the system at 11 and is cooled in 12 and separated to produce liquid nitrogen. The liquid nitrogen passes through heat exchanger 21 which vaporizes the nitrogen and liquefies an incoming natural gas. The '388 British patent does not explicitly state how the liquid nitrogen is separated from the incoming air (although some system must be present since air enters and oxygen and nitrogen exit). While a distillation column is considered an obvious device to perform the function, Gaumer et al , none the less show using nitrogen from an air separation system as refrigerant which is isentropically expanded to liquefy a natural gas stream to be old I the natural gas processing art. It would have been obvious to one of ordinary skill in the art from the teaching of Gaumer et al to modify the natural gas liquefying system of the '388 British patent by using nitrogen from an air separation system as the coolant which is isentropically expanded to produce the cooling required to liquefy the natural gas. In regard to claims 10,23,40 and 56, the use of the oxygen derived by the system is seen as a matter of obvious intended use. The use of the oxygen in any of applicant's claimed previously known processes is not seen to be critical to either the liquefaction process or the separation process which are integrated in the claim. Claim 58 is seen as obvious duplication of disclosed parts.

Claims 3,17,31,32,48 and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over the '388 British patent in view of Gaumer et al as applied to claims 1,2,4,5,10,15,16,18,19,23,28-30,33-35,40,41,45,47,52,56,57,58 and 62 above, and further in view of Nagamura et al.

The British patent, as modified, discloses applicant's basic inventive concept, an integrated air separation system and a natural gas liquefaction process, substantially as claimed with the exception of specifying a two column separation system. Nagamura et al show this feature to be old in the air separation art. It would have been obvious to one of ordinary skill in the art at the time of applicant's invention from the teaching of Nagamura et al to modify the air separation system of the British reference by using a two column system to improve the separation of the air. Official Notice is taken that expanding air in a turbine prior to entry into a column is well known in the art to control the pressure in the column while providing required refrigeration and possible work recovery. As such, the expansion of the air entering the column of Nagamura et al would have been obvious to an ordinary practitioner in the art.

Allowable Subject Matter

Claims 6-9,11-14,20-22,24-27,36-39,42-44,51,53-55,60 and 61 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Bocquet et al show a system using liquid nitrogen to liquefy natural gas. Houshmand et al shows a system for treating natural gas and liquefying a portion of the natural gas using refrigeration derived from the separation system. Wissolik, Agrawal, Streich et al and Perrotin show air separation systems with the refrigeration provided by liquefied natural gas.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William C. Doerrler whose telephone number is (571) 272-4807. The examiner can normally be reached on Monday-Friday 6:30-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl Tyler can be reached on (571) 272-4834. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


William C Doerrler
Primary Examiner
Art Unit 3744

WCD